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CURRENT LITERATURE.

BOOK REVIEWS.

The sea beach.

WE FANCY that there is a demand for a popular account of the seaweeds. It is not so important that the names and classification should be given, for such may be found in several well-written manuals and texts. What is probably most desired is a simple account of the life habits, and in part the life histories of such forms as are prominent in the tide pools, on rocky shores, in marshes, and in flats, and those that are washed up from the deeper waters after storms. A book by Augusta Foote Arnold¹ attempts to satisfy the thirst for seaside lore, and this review will discuss some points in her treatment of the marine algae. They are given only 50 pages in a book some 500 pages long, the remainder of the work dealing with the marine invertebrates, so it would be unjust to judge *The sea-beach at ebb tide* as a whole by the criticisms presented here.

It is hard to understand precisely the attitude of this author as regards the relation of popular science to technical science, or to put matters somewhat differently, the balance between the charm of natural history and the detail of a fully developed science. There is a little of both in this book, the science badly mutilated and sometimes incorrect, the natural history quite lacking the delicate fanciful touches that demand an imagination and yet must be tempered by many years of intimate contact with nature and by knowledge of scientific exactness and respect for it.

There is a brief account of the life habits, distribution, and uses of algae, and some statements about naming and classification which would lead the reader to suppose that especial emphasis would be laid upon these departments. And this is the case, for most of the space is devoted to the description and illustration of genera and species. These are apparently arranged after the system of a standard text, much abridged of course, the outline being presented at the beginning of each group. These synopses can be nothing but a mere dictionary-like table of names, for the account does not pretend to give the morphological characters of the groups. There are no keys, no microscopical examination is required, and for identification the reader (presumably beginner) must depend chiefly upon the figures. What

¹ARNOLD, AUGUSTA FOOTE: *The sea-beach at ebb-tide*. A guide to the study of the seaweeds and the lower animal life found between tide-marks. Small 8vo. pp. xii+490. *figs.* 600+. New York: The Century Co., 1901.

then can be the value of this classification, out of sympathy with the purposes of morphology on the one hand and the spirit of natural history on the other?

The illustrations are photographs of mounted algae on cards, and in some cases of preparations slightly magnified. While many are clear others seem to the writer quite valueless as a means of identification and unworthy of the book. Although the color of the specimen would help in this mechanical matching of mounts with figures, nevertheless there is sure to be much confusion. For example, how is *Enteromorpha clathrata* to be distinguished from certain *Cladophoras*? The figure of *Ectocarpus viridis* might do for several other species, the *Callithamnia* are quite impossible, and *Polysiphonia fastigiata* is certain to be confused with *Sphacelaria*.

One occasionally finds statements that lead to the belief that the author is quite untrained in natural history. Thus, on page 29 is the phrase "*Ectocarpus Hooperi*, a species of *Ectocarpus* first described by Mr. Hooper." This does not seem to be a fact, and the impression conveyed that naturalists name species after themselves is an implication of conceit far from being warranted by the conduct of these modest members of society.

The book has yet to be written that will tell the natural history of seaweeds with the charm of manner shown in the style of Miss Margaret Morley. And until such a treatment appears, it is much better that the amateur collector and observer of marine algae read Murray's *Introduction to the study of sea-weeds*, a simple and very interesting account, and one thoroughly grounded in science.—B. M. DAVIS.

NOTES FOR STUDENTS.

PROFESSOR ARNOLDI² has taken up the somewhat incomplete work of Shaw, and has made a careful study of the development of the endosperm of *Sequoia sempervirens*. Free nuclear division takes place in the usual manner in an evenly distributed peripheral layer of protoplasm, but very soon there is a denser accumulation of protoplasm at the lower end of the sac. When the formation of walls begins, three regions of the endosperm may be distinguished, the upper, the lower, and the middle. The upper, and particularly the lower, develop faster than the middle, so that the ends of the sac become filled with a solid tissue while the nuclei are still almost free in the middle portion. Each nucleus of the middle portion now becomes surrounded by a wall which is open on the inner side: the walls grow inward and when the center is reached, walls are formed at the inner ends of the cells. The nucleus now begins to divide, and each of these cells ("alveoli") becomes divided into several cells. Archegonia are formed only from these

² ARNOLDI, W.: Beiträge zur Morphologie einiger Gymnospermen. I. Die Entwicklung des Endosperms bei *Sequoia sempervirens*. Bull. des Natur. de Moscow. Pp. 1-13. Pls. 7-8. 1899.